

We claim

- 5        1) A method of concentrating and purifying a target entity in a liquid sample, said method comprising contacting said sample with a superabsorbent polymer or a superabsorptive composite material to absorb at least a portion of the sample by said polymer.
- 10       2) The method according to claim 1 where the target entity is dissolved in the sample.
- 3) The method according to claim 2 where the sample contains additional dissolved compounds other than the target entity.
- 15       4) The method according to any one of the preceding claims, comprising absorbing the solvent of the sample with the superabsorbent polymer or the superabsorbing composite material, thereby reducing the volume of the sample.
- 5) The method according to claim 4, comprising absorbing the further dissolved compounds in said sample with the superabsorbent polymer or the superabsorbing composite material.
- 20       6) The method according to any one of the preceding claims, comprising contacting said sample with a superabsorbent polymer.
- 7) The method according to any one of the preceding claims, wherein the solvent is a hydrophilic solvent, preferably water or a mixture of water and a water miscible solvent.
- 25       8) The method according to any one of the preceding claims, further comprising separating the target entity from the swollen superabsorbing polymers or superabsorbing composite materials.
- 9) The method according to any one of the preceding claims, where the target entity is a peptide or polypeptide.
- 30       10) The method according to claim 9, wherein the peptide or polypeptide is an enzyme, an antibody or antibody fragment, an interferon, a blood clotting factor, erythropoietin, insulin, a hormone or a cytokine.
- 11) The method of any one of claims 1-10, wherein said target entity is an oligosaccharide, a polysaccharide or a polyketide.

12) The method of any one of claims 1-8, wherein said target entity is a nucleic acid.

13) The method of claim 12, wherein the nucleic acid is single-stranded or double-stranded DNA or RNA, or combination thereof, preferably genomic, viral or plasmid DNA, cDNAs, PCR products or viral RNA.

5 14) A method according to any one of claims 1-8, wherein the target entity is a viral particle, preferably an adenovirus, adeno-associated virus, retrovirus, lentivirus, poxvirus or herpes virus.

15) A superabsorbing polymer comprising polymerized vinylic monomers and anionic, cationic and/or zwitterionic monomers.

10 16) The superabsorbing polymer of claim 15, wherein said vinylic monomers are acrylic monomers, acrylic acid or methacrylic acid derivatives, or mixtures thereof.

17) The superabsorbing polymer of claim 16, wherein said acrylic acid and/or methacrylic acid derivatives are amides and/or esters thereof.

15 18) The superabsorbing polymer of any one of claims 15 to 17, wherein said polymer is a co-polymer comprising polymerized ionized or ionizable acrylic monomers.

19) The superabsorbing polymer of claim 18, wherein said ionized or ionizable acrylic monomers are present in concentrations of 0.1 – 100 % of the total monomers.

20 20) The superabsorbing polymer of any one of claims 15 to 19, wherein said polymer comprises polymerized acrylate, 3-(methacryloylamino)propyl trimethylammonium chloride and/or [3-(methacryloylamino)propyl]dimethyl(3-sulfopropyl)ammonium hydroxide.

21) The superabsorbing polymer of any one of claims 15 to 20, wherein said polymer is crosslinked, preferably with a crosslinking degree of 0.0001 – 10 %, further preferred with a crosslinking degree of 0.01 – 1 %.

25 22) The superabsorbing polymer of any one of claims 15 or 21, said polymer further comprising a sorbent dispersed in said polymer.

23) The superabsorbing polymer of any one of claims 15 to 22, wherein said polymer undergoes swelling upon contact with water or an aqueous solution.

24) A powder comprising the superabsorbing polymer of any one of claims 15 -23.

30 25) A bead comprising the superabsorbing polymer of any one of claims 15 -23, preferably with a diameter in the range of 0.001 – 10 mm, more preferably with a diameter in the range of 0.1 – 4 mm.

26) A surface coating comprising the superabsorbing polymer of any one of claims 15 -23.

27) A device comprising the superabsorbing polymer of any one of the claims 15-23.

28) The device of claim 27, comprising a container selected from the group consisting of a sample tube, a centrifuge tube, a pipette tip, a column, a syringe and a microtiter plate.

5 29) The device of claim 28, wherein said superabsorbing polymer is filled into, bound to, or polymerized onto said container.

30) A process for making a superabsorptive polymer, said process comprising hydrolysis of cross-linked polyacrylamide.

10 31) The process of claim 30, wherein said hydrolysis is obtained by treating said cross-linked polyacrylamide with alkali.

32) A process for making a superabsorptive polymer, said process comprising polymerizing ionized or ionizable acrylic monomers in the presence of a cross-linking agent.

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